KP1 Keypad

User Manual

Revision 2.1

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Revision History

Version	Date	Description
1.0	2011	Initial release
2.0	4/2/2013	Added grids and cursors measurement description and updated On Screen Display (OSD) information
2.1	20/3/2013	Added addition information to calibration section for optimum results

Package Contents

Your Inspex HD package contains:

- KP1 external keypad
- Operation manual

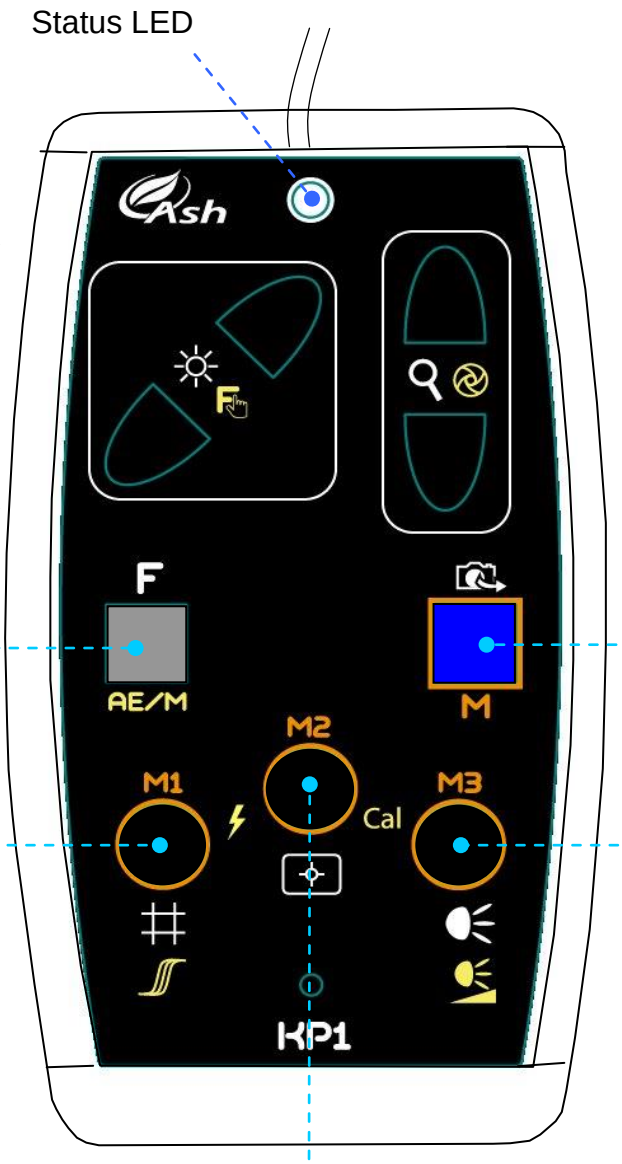
Please retain the packaging in case there is a need to return the unit for service or repair.

Important Safety Information

Please read all of the following instructions before setting up.

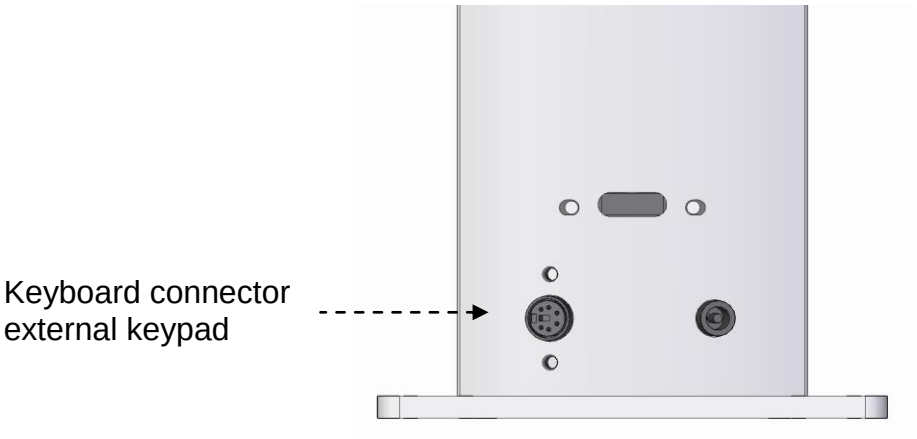
- To prevent fire or electric shock please ensure this unit is kept away from all liquids. Do not use the unit in excessively damp or wet areas and do not expose it to rain, snow, etc.
- Before cleaning the unit, please ensure that it is unplugged. Use a slightly damp cloth to clean the exterior. Do NOT use solvents or aerosol cleaners.
- This unit should never be opened. Unauthorized servicing will invalidate your warranty. If you encounter any problems with this unit please contact your local dealer.
- The KP1 is designed to connect only to Ash products. Do not connect it to a PC or any other electronic equipment as damage to both products may result.
- Only connect the KP1 when the Ash unit is powered off.

Keypad Layout



Installation

This keypad is an external keypad used in conjunction with the Ash Inspex HD family of inspection products. Power off the Inspex. Insert the mini-din plug connector at the end of the KP1 cable into the mini din socket on the Inspex unit. For example the diagram below shows the mini-din socket to which the KP1 connects on an Ash Inspex HD VESA.



Turn on the unit. The KP1 LED should light up green indicating that it has power and is up and running.

Controls

The following table describes the button operation of the KP1. Note that most buttons have multiple functions depending on the keypad mode.

Key
SP: Short Press
LP: Long Press
SP/LP: Short or Long button press
NA: Not Applicable
OSD: On Screen Display

Button	Short Press	Long Press	Indicator		Description
			OSD	LED	
	1. ZOOM + 2. GRID/CURSOR + 2. LED INTENSITY + 3. IRIS SIZE + 4. CONTRAST +	NA	 	 	Default Mode **SP/LP**: Zoom in Measurement Mode **LP**: Move Y Grid / Cursor up Light Mode **SP/LP**: Increase LED intensity IRIS Mode **SP/LP**: Increase IRIS size Hi-Contrast Mode **SP/LP**: Increase contrast
	1. ZOOM – 2. GRID/CURSOR – 2. LED INTENSITY – 3. IRIS SIZE – 4. CONTRAST –	NA	 	 	Default Mode **SP/LP**: Zoom out Measurement Mode **LP**: Move Y Grid / Cursor down Light Mode **SP/LP**: Decrease LED brightness IRIS Mode **SP/LP**: Decrease IRIS size Hi-Contrast Mode **SP/LP**: Decrease contrast
	1. FAR FOCUS 2. BRIGHTNESS + 3. GRID/CURSOR + 4. GAIN +	NA	**FAR** 	 	Focus Mode **SP/LP**: Move the focus point further away from the camera Measurement Mode **LP**: Move X Grid / Cursor right Auto Exposure Mode **SP/LP**: Increase brightness in Automatic Exposure mode. Overridden by manual focus when in Manual Focus Mode Gain Mode **SP/LP**: Increase gain in Manual Exposure mode
	1. NEAR FOCUS 2. BRIGHTNESS – 3. GRID/CURSOR –	NA	**NEAR**		Focus Mode **SP/LP**: Move the focus point nearer to the camera Measurement Mode **LP**: Move X Grid / Cursor Left

	4. GAIN –		☼ 	 	Auto Exposure Mode **SP/LP**: Decrease brightness in Automatic Exposure mode. Overridden by manual focus when in Manual Focus Mode Gain Mode **SP/LP**: Increase gain in Manual Exposure mode. Overridden by manual focus when in Manual Focus Mode
F 	FOCUS TOGGLE *(Manual or Auto)*	EXPOSURE TOGGLE (*Manual or Auto*)	**AF/MF** **ME**	 	**SP**: Toggle between manual focus mode and auto focus. When in Manual focus mode the KP1 LED will turn red. **LP**: Toggle between Auto Exposure Mode and Manual Exposure Mode
 	CAPTURE IMAGE	ENTER MEMORY MODE	 **M**	 	**SP**: Capture the current image displayed. **LP**: Enter Memory Mode
 M1	CYCLE GRID / CUROSR MODES MEMORY RECALL 1	SELECT GRID TPYE / SWITCH CURSOR ENTER CONTRAST MODE CYCLE CALIBRATION UNITS SAVE MEMORY 1		 	Default Mode **SP**: Cycle between grids / cursors **LP**: Default Mode: Enter HI-Contrast Mode. Use ⌓ and ⌔ buttons to control contrast. Calibration Mode **LP**: Cycle calibration units Measurement Mode **LP**: Change Grid type or switch cursor selection Memory Mode **SP**: Memory recall 1 in Memory Mode **LP**: Save current settings to memory 1 in Memory Mode
 M2	OVERVIEW MEMORY RECALL 2	CYCLE CROSSHAIR COLOUR EXIT CALIBRATION SAVE MEMORY 2	**M**	 	Default Mode **SP**: Do overview function **LP**: Toggle Cross Hairs. Calibration Mode **LP**: Exit calibration mode Memory Mode **SP**: Recall memory 2 in Memory Mode **LP**: Save current settings to memory 2 in Memory Mode
 M3	LIGHT ON / OFF MEMORY RECALL 3	ENTER LIGHT CONTROL MODE SAVE MEMORY 3		 	Default Mode **SP**: Toggle light on / off **LP**: Enter light control mode Memory Mode **SP**: Mem recall 3 in Memory Mode **LP**: Mem save current settings to Mem 3 in Memory Mode

Using the KP1

Default Mode

This mode is where the camera is in auto-exposure mode. The arrow buttons ∩ and ∪ revert to zoom in and zoom out functions respectively.

On power up the camera will revert to the last used settings for zoom position, exposure, focus, Iris, gain, brightness and contrast settings.

Status Bar

The status bar is located at the top left of the screen. It displays the current operating mode of the Inspex. The following table describes the meaning of each symbol:

AE	Automatic Exposure mode
ME	Manual Exposure mode
AF	Automatic Focus
MF	Manual Focus
	Light Intensity adjust mode
	Hi Contrast adjust mode
	Gain adjust mode
	Brightness adjust mode
	Iris adjust mode
M	Memory select mode
	Freeze mode

Auto Exposure Mode

When the unit is in this mode the exposure settings are controlled automatically by the camera (this includes iris and gain control). The status bar will show the **AE** symbol.
The arrow buttons ∩ and ∪ act as zoom in and zoom out functions respectively unless the unit is in Light Mode or Hi-Contrast mode.
The and buttons control the brightness function when in Auto Exposure mode unless Manual Focus mode is engaged. Manual Focus mode is indicated when the LED is red.

Manual Exposure Mode

This mode is entered with a long press of the Focus button . The **ME** symbol will appear on the top left of the screen to indicate that the unit is in Manual Exposure mode. It will remain there while the unit remains in Manual Exposure Mode. Notice that the Gain symbol and Iris symbol are also displayed in the status bar to indicate new function for the arrow buttons. The arrow buttons ∩ and ∪ now control the Iris function within the

camera. The button will open the Iris further while the button will close the Iris in discrete steps.
The and buttons now control the gain of the image. Note that if Manual Focus is engaged then these buttons will be overridden and will be used to control the focus of the camera (indicated by a red LED).

Memory Mode

Press and hold the button to enter memory Mode. The LED will light up orange and the **M** symbol will appear on the status bar. In this mode the three circular buttons M1, M2 and M3 on the bottom of the keypad are associated with the three available memory presets.
To recall the memory settings in memory 1 press the M1 button. To save the current settings to memory 1 press and hold the M1 button until a sound is heard. Similarly perform the same operations for buttons M2 and M3 to save/recall memory settings for memory 2 and memory 3 respectively. To exit memory mode press any key except M1, M2 or M3.

The following parameters are saved during a memory save operation:

- Zoom Position
- Light setting/intensity
- Brightness setting
- Gain setting
- Iris Setting
- Focus
- Focus Position
- Contrast Setting
- Calibration data

Manual Focus Mode

To enter Manual Focus mode press the focus button . The LED will turn red and a sound will be played. The status bar will show the **MF** symbol. The camera is now operating in manual focus mode from the current focus position. The button is used to move the focus point further away from the camera. The button is used to move the focus point nearer the camera. Note that the longer you hold the focus buttons the faster the focus point will move to help reach the required focus point quickly. To exit Manual Focus mode simply press the focus mode button again and the LED will turn green and the camera will return to Auto Focus mode.

Light Intensity Mode

To enter light mode press and hold the M3 button . You will hear a sound play and the Light icon will appear on the status bar. The arrow buttons and now control internal light intensity on the unit. Pressing will increase the brightness of the LED while pressing will decrease light intensity. To exit this mode press and hold the M3 button again or wait for it to time out.

Light On/Off

To turn the light off completely press the M3 button . You will hear a sound play and light will turn off. Press the button again to return the light back to the previous setting.

Hi-Contrast Mode

Press and hold the M1 button ● to enter this mode. You will hear a sound play and the contrast icon ◪ will appear on the screen. The arrow buttons ∩ and ∪ now control the image contrast. Pressing ∩ will increase the contrast of the LED while pressing ∪ will decrease contrast. Press the ∩ button to the maximum setting to return back to normal colour mode. To exit this mode press and hold the M1 button ● again.

Image Capture

If the Inspex unit to which the KP1 is connected has the Ash Capture Control hardware and PC connected then image capture is possible. To save the current image displayed press the capture button ■ . An icon will flash on the screen and a sound will be played.

See the Ash Capture Control user guide for more information.

Magnification

Press the Zoom-Up button to enlarge the image and Zoom-Down to reduce the image size. The unit will make a sound to indicate when it has reached maximum or minimum zoom limits.

Freeze

To freeze the image, press the M2 button and immediately press the M1 button. To unfreeze the image, press any other button. Note that capture is allowed in freeze mode.

Overview

Overview allows you to easily locate a point of interest on the object you are viewing. Press and release the Overview button , M2, to make the camera zoom out fully and revert to full-colour mode. A cross hair is displayed in the centre of the screen as an aid to location. Place the point of interest under the cross hair and press any key to restore the magnification to the previous level.

Cross Hairs

Cross hairs are two artificially generated lines that appear on the screen in both the horizontal and vertical directions which intersect at the centre of the screen. Press and hold the Overview button M2 to display the crosshairs. When the cross hairs appear release the button. To remove the cross hairs press and hold the overview button once again.

If you would like to change the colour of the cross hairs then press and hold the overview button, however do not release the button when the cross hairs appear. Instead keep the button pressed and you will see the cross hair change colour. The colours will cycle through the following sequence: white, green, blue, red, yellow, purple, cyan and then back to white again. Release the button the when desired colour is displayed.

Brightness and Gain

The image brightness can be adjusted to suit your preference. When the unit is in Auto Exposure mode, the and buttons control brightness level. When the unit is in Manual Exposure mode, (indicated by an **ME** symbol at the top left of the screen), these buttons will control gain. The setting you choose will be saved and used subsequently for that mode of operation.

Grid and Cursor Measurement

The KP1 can be used in conjunction with the Inspex HD to perform on screen measurements. Pressing the M1 button will cycle between grids, cursors and normal (non measurement) modes.

Calibration Procedure

In order to measure an on-screen object the system must be calibrated first. To do this perform the following steps:

1. Place the object to be measured under the camera.
2. Adjust the camera zoom to the required position so that the object is at the optimum magnification in the centre of the screen.
3. Set the unit to manual focus and adjust the focus position until the object is sharply focussed.

4. Place a suitably calibrated device such as a ruler or calibration sticker under the camera.
5. Enter calibration mode by pressing and holding the ● M3 button while immediately pressing the ● M2 button. The screen should now display CAL MODE and two vertical cursors should appear. The unit will automatically enter manual focus mode.
6. Press the ● M1 button to select the calibration unit (e.g. 1mm, 5mm, 10mm…). Using the ◆ and ◆ buttons adjust the left and right cursor so that they align on the ruler scale and match the desired calibration unit.
7. Press and hold the ● M2 button to exit calibration mode. The unit is now calibrated. Note that the unit will lose calibration if the zoom or focus positions are changed.

Notes on Calibration

- For optimum measurement results try to keep the calibration and measurement functions within the centre area of the display. This will reduce the effect of lens distortion which can affect the measurement accuracy. Inherent lens distortion increases the closer you are to the edge of the display in both the X and Y directions.
- Calibrate the unit using a measurement as close as possible to the actual measurements you intend to make.
- Where possible, avoid taking measurements with the unit fully zoomed-out as this condition is prone to higher non-linearity lens distortion.

Grid Mode

In this mode a grid will appear on the screen. The grid is adjustable is size in both the X and Y directions. To adjust the grid size in the X direction use the ◆ and ◆ buttons. To adjust the grid size in the Y direction use the ∩ and ∪ buttons. The distance between the grid lines in both X and Y directions is displayed at the top right corner of the screen.

Grid Adjust Mode

In grid mode press and hold the ● M1 until a red grid appears on the screen. The grid position is adjustable in both the X and Y directions. To adjust X position of the grid use the ◆ and ◆ buttons. To adjust the grid position in the Y direction use the ∩ and ∪ buttons.

Cursor Mode

Cursor mode allows you to take measurements using cursors in both the X and Y directions. The X direction cursor can be controlled using the ◆ and ◆ buttons and the Y direction cursor using the ∩ and ∪. The active cursors are highlighted in red. To change the active cursors press and hold the ● M1 button.

Front Keypad Lockout

In certain applications it may be desirable to disable the operation of the front keypad on the Inspex HD camera head. To do this press and hold the ● M1 button and immediately press the ● M3 button until you see the message “FRONT KEYPAD LOCKED”. The only button operational on the front keypad is the power button. To unlock the keypad repeat

the key press. The Inspex HD will remember this setting even after powering off the unit. The unit can only be unlocked using the KP1. If the KP1 is not connected at power up the front keypad will remain locked. A notification will be displayed at start-up to indicate this.

Troubleshooting

If the KP1 fails to operate check the following:

- Ensure that the plug is securely inserted into the Ash unit.
- Inspect the cable for damage including fraying.
- Check that the LED is green. If the LED does not turn on the check that the Ash Inspex unit to which the keypad is connected is powered on.

Note: Only connect the KP1 when the Ash Inspex unit is powered off.

Taking Care of your Keypad

Clean with a soft, dry cloth. Do **not** use a wet or coarse cloth, avoid detergents and abrasive substances or solvents to clean it.

Appendix: Functions and Terms

Zoom Lens: The zoom lens makes an object appear closer or further away.

Iris: The Iris controls the amount of light entering the camera. Changing the Iris can affect the depth of field particularly at high magnification.

Gain: Increasing the video gain boosts the video signal level to make subjects appear brighter in low-light situations.

Focus: Focus is seen as the region of an image that is displayed in clarity while the other regions of the image appear blurry. There are two types of focus Automatic and Manual. Automatic focus keeps the current image in focus by analysing the image and updating the focus lens continually. Manual focus is whereby the user can set the focus point near or far away.
Generally automatic focus is used for general purpose viewing, however when a object is to be viewed under high magnificent, manual focus has the advantage of being able to change the focus point so that different parts of the object of interest can be viewed clearly without having to adjust camera height.

Hi-Contrast: In this mode darker parts of the image are made darker and brighter made brighter. For example, this may be particularly useful for highlighting text on an object that otherwise would be difficult to read.

Brightness: This is used to increase or decrease the video signal level to help set the black level for truer picture reproduction.

Exposure: There are two types of exposure modes, automatic and manual. Automatic exposure controls functions such as shutter, Iris and gain settings to maintain the optimum exposure level. Manual exposure allows manual control of gain and iris which may help in low light conditions and where improved depth of field is required.

Specifications

Dimensions(mm):	148(L) x 87(W) x 29(H)
Voltage:	3.3V
Weight	180g
Temperature:	Storage: -10°C to +60°C. Operating: +5°C to +40°C

Warranty

Ash Technologies warrants the equipment, when purchased new, to be free from defects in material and workmanship and will repair or replace at Ash Technologies' discretion, any equipment which exhibits such defects; provided that the equipment has been operated under the proper conditions of installation and has not been tampered with by any persons not authorised by Ash Technologies or its agents and that it is solely serviced by Ash Technologies or its agents.

In no event shall Ash Technologies or its agents be liable for special, indirect, incidental or consequential damages; the original user's remedies being limited to repair or replacement. This warranty is valid only when serviced in the country of original purchase.

Ash Technologies makes no other or further warranty, express or implied, including and warranty of fitness for a specific purpose or warranty of merchantability.

This warranty is valid for a period of
12 Months
effective from the date of delivery.

For warranty claims or service during or after warranty period please contact your distributor.

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